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ABSTRACT

In order to ascertain the extent to which older persons' levels of behavioral functioning parallel their levels of intellectual functioning, 42 female patients, aged 61-99, of an outpatient comprehensive care geriatric clinic, completed the Wechsler Adult Intelligence Scale (WAIS), the Instrumental Activities of Daily Living Scale (IADL), the Hamilton Rating Scale for Depression (HRS), and the modified Hachinski Ischemic Score (MHIS), a measure of vascular conditions. The tests were administered in their homes. The subjects, who were participants from a larger study, met the following selection criteria: female; right-handed; level of education less than high school graduate; annual income less than \$8,000; no clinically observable aphasia or apraxia; no psychotropic drugs within 2 weeks of testing; score indicating only mild depression or normal mood on the Hamilton Scale; and no history of medical or psychiatric problems which might affect mental functioning. Analyses of results showed that the overall correlation between intellectual functioning (WAIS full IQ) and behavioral difficulties (IADL) was significant and remained so even after the effects of age, vascular condition, and depression were partialled out. However, there was considerable variability in the behavioral functioning of subjects across all levels of intellectual functioning. Appendix A provides the scoring for the IADL scale by item, and Appendix B provides the scoring for MHIS. (MCF)

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A COMPARISON OF INTELLECTUAL AND BEHAVIORAL FUNCTIONING IN OLDER PERSONS

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THE PRESENT STUDY WAS AN EXPLORATION OF THE RELATIONSHIP BETWEEN INTELLECTUAL FUNCTIONING AND BEHAVIORAL FUNCTIONING IN OLDER PERSONS. IN PARTICULAR, IT WAS OF INTEREST TO ASCERTAIN THE EXTENT TO WHICH OLDER PERSONS' LEVELS OF BEHAVIORAL FUNCTIONING PARALLEL THEIR LEVELS OF INTELLECTUAL FUNCTIONING. THE SUBJECTS, 42 PATIENTS OF AN OUTPATIENT COMPREHENSIVE CARE GERIATRIC CLINIC, WERE ADMINISTERED A VARIETY OF PSYCHOLOGIC MEASURES IN THEIR HOMES. THE OVERALL CORRELATION BETWEEN INTELLECTUAL FUNCTIONING (WAIS FULL IQ) AND BEHAVIORAL DIFFICULTIES (LAWTON IADL SCALE) WAS SIGNIFICANT ($r = -.45$) AND REMAINED SO EVEN AFTER THE EFFECTS OF AGE, VASCULAR CONDITIONS AND DEPRESSION WERE PARTIALLED OUT. HOWEVER, THERE WAS CONSIDERABLE VARIABILITY IN THE BEHAVIORAL FUNCTIONING OF SUBJECTS ACROSS ALL LEVELS OF INTELLECTUAL FUNCTIONING. AT HIGH-TO-MODERATE INTELLECTUAL LEVELS, 65% OF THE SUBJECTS WERE FUNCTIONING ABOVE THE MEDIAN BEHAVIORALLY, BUT 35% WERE FUNCTIONING BELOW; AT LOW INTELLECTUAL LEVELS, 68% WERE FUNCTIONING BELOW THE MEDIAN BEHAVIORALLY, BUT 32% WERE FUNCTIONING ABOVE. AGE, VASCULAR CONDITIONS, AND DEPRESSION WERE EXAMINED AS CONTRIBUTORS TO THIS VARIABILITY, AND THE NEED FOR A MULTI-FACETED EVALUATION OF OLDER PERSONS WAS NOTED.

The present study was an exploration of the relationship between intellectual functioning and behavioral functioning in older persons. In particular, it was of interest to ascertain the extent to which older persons' levels of behavioral functioning parallel their levels of intellectual functioning.

Method

Subjects. Subjects in this study were participants in a larger study (Kramer, 1981). They were 42 patients selected from the roster of an outpatient comprehensive care geriatric clinic. To be selected, they had to meet all of the following criteria: (1) female, (2) right-handed, (3) level of education less than high school graduate, (4) annual income less than \$8000, (5) no clinically observable aphasia or apraxia, (6) no psychotropic drugs within two weeks of testing, (7) score of less than 18 on the 23-item version of the Hamilton Rating Scale for Depression (Hamilton, 1967) (scores below 18 are generally considered to reflect either mild depression or normal mood), and (8) no history of significant medical or psychiatric conditions excepting cerebrovascular and associated cardiovascular problems (see Appendix 2), which might affect mental functioning (head trauma, Parkinson's disease, schizophrenia, etc.). The subjects ranged in age from 61 to 99 years (mean = 76.0; standard deviation = 7.87). Level of education ranged from 1 to just less than 12 years (mean = 6.83; standard

deviation = 2.60). Thirty-seven subjects were white, five were black.

Measures. For this study, subjects were given the following:

- (1) Wechsler Adult Intelligence Scale.
- (2) Instrumental Activities of Daily Living Scale (Lawton and Brody, 1969). The IADL scale was scored so that subjects were given full, partial, or no credit for each of the scale's 10 items (see Appendix 1); the 10 item scores were then summed to yield a total score.
- (3) Hamilton Rating Scale for Depression (Hamilton, 1967).
- (4) Modified Hachinski Ischemic Score (Rosen et. al., 1980).

The MHIS is a measure of vascular conditions, with particular attention to cerebrovascular problems. (The scoring system used in this study was modified from that of Rosen et. al., 1980.

See Appendix 2).

Procedure. Subjects were tested on the WAIS in their own homes.

IADL scale scores and HRS scores were determined by the examiner, using all available information (subjects' self-reports, caretakers' and relatives' reports, examiner's observations, etc.). MHIS's were based on subjects' clinic medical charts.

Results

The mean WAIS FIQ score was 89.12 (standard deviation = 15.50).

The mean IADL scale score was 2.70 (standard deviation = 2.71); the median scores were 1.58/2.00. The mean HRS score was 6.67 (standard deviation = 4.08). The mean MHIS was 2.34 (standard deviation = 1.94).

Other results are given in Tables 1-5. Note that the overall correlation

between intellectual functioning (WAIS Full IQ) and behavioral difficulties (IADL Scale) was $-.45$ (Table 1). This result compares well with a correlation of $.51$ between scores on an index of cognitive impairment and IADL scores found by Zarit et. al. (1980), in a sample of 29 patients with senile dementia.

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Table 1

CORRELATION MATRIX

	Intellectual Functioning (WAIS FIQ)	Behavioral Functioning (IADL)	Age	Vascular Status (MHIS)	Depression (HRS)
Intellectual Functioning (WAIS FIQ)	x	-.45*	-.09	-.20	-.24
Behavioral Functioning (IADL)		x	.64*	.43*	.10
Age			x	.39*	.03
Vascular Status (MHIS)				x	.34*
Depression (HRS)					x

*p .01 if $r > .42$ (2-tailed).02 if $r > .38$.05 if $r > .32$

Table 2

PARTIAL CORRELATIONS

IADL x WAIS FIQ with AGE PARTIALLED

$$r = -.51$$

IADL x WAIS FIQ with VASCULAR STATUS PARTIALLED
(Modified Hachinski Ischemic Score)

$$r = -.40$$

IADL x WAIS FIQ with DEPRESSION PARTIALLED
(Hamilton Rating Scale)

$$r = -.45$$

MULTIPLE CORRELATIONS

IADL x AGE and WAIS FIQ

$$R = .75 \quad R^2 = .56$$

Table 3

DISTRIBUTION OF SCORES
BY LEVEL OF INTELLECTUAL FUNCTIONING
AND LEVEL OF BEHAVIORAL FUNCTIONING

IADL

		Above median	Below median		
WAIS FIQ	HI	15	8	$r = -.45$	
	LO	6	13		

WAIS VIQ		14	11	$r = -.41$	
		7	10		

WAIS PIQ		15	7	$r = -.45$	
		6	14		

NOTE: For WAIS IQ, HI = 85 or above, LO = less than 85.
 For IADL, above median = less than 2.0, below median = 2.0 or greater (higher scores mean poorer functioning).

Table 4

MEAN IQ BY AGE AND ADL STATUS

IADL

		Above median	Below median
AGE	60-69	84.25 N=8	---
	70-79	98.90 N=11	85.50 N=12
	80-89	110.00 N=2	81.70 N=9

Table 5

MEAN AGE BY IQ AND ADL STATUS

IADL

WAIS
FIQ

		Above median	Below median
HI		72.8	78.8
		N=15	N=8
LO		69.0	81.3
		N=6	N=13

Appendix 1

Scoring for IADL Scale

A. Ability to use telephone	
1. Does not use telephone at all	1
2. Answers telephone but does not dial	2/3
3. Dials a few well-known numbers	1/3
4. Operates telephone on own initiative-- looks up and dials numbers, etc.	0
B. Shopping	
1. Completely unable to shop	1
2. Needs to be accompanied on any shopping trip	2/3
3. Shops independently for small purchases	1/3
4. Takes care of all shopping needs independently	0
C. Food Preparation	
1. Needs to have meals prepared and served	1
2. Heats and serves prepared meals, or prepares meals but does not maintain adequate diet	2/3
3. Prepares adequate meals if supplied with ingredients	1/3
4. Plans, prepares and serves adequate meals independently	0
D. Housekeeping	
1. Unable to participate in any housekeeping tasks	1
2. Needs help with all home maintenance tasks	3/4
3. Performs light daily tasks but cannot maintain acceptable level of cleanliness	1/2
4. Performs light daily tasks such as dishwashing, bed-making	1/4
5. Maintains house alone or with occasional assistance (e.g., "heavy work - domestic help")	0
E. Laundry	
1. All laundry must be done by others	1
2. Launders small items--rinses socks, stockings, etc.	1/2
3. Does personal laundry completely	0
F. Mode of transportation	
1. Does not travel at all	1
2. Travel limited to taxi or automobile with assistance of another	3/4
3. Travels on public transportation when assisted or accom- panied by another	1/2
4. Arranges own travel via taxi, but does not otherwise use public transportation	1/4
5. Travels independently on public transportation or drives own car	0

(continued on next page)

Appendix 1 (cont'd)

- | | | |
|---|-----|--|
| G. Responsibility for own medications | | |
| 1. Is not capable of dispensing own medication | 1 | |
| 2. Takes responsibility if medication is prepared in advance in separate dosages | 1/2 | |
| 3. Is responsible for taking medication in correct dosages at correct time | 0 | |
| H. Ability to handle finances | | |
| 1. Incapable of handling money | 1 | |
| 2. Manages day-to-day purchases, but needs help with banking, major purchases and cannot be trusted to write checks or keep accurate record of money spent | 1/2 | |
| 3. Manages financial matters independently (budgets, writes checks, pays rent, bills, goes to bank), collects and keeps track of income | 0 | |
| I. Ability to perform household repairs or chores | | |
| 1. Unable to do even simple household repairs or chores | 1 | |
| 2. Can do simple repairs or chores such as hanging a picture or mowing the lawn, but needs help or cannot do more involved repairs such as fixing a leaking faucet, wiring electrical connections, etc. | 1/2 | |
| 3. Is able to perform most household chores or repairs (repairing a leaky faucet, seasonal maintenance on furnace and air conditioners, repairing rain gutters, etc.) | 0 | |
| J. Skill in driving an automobile | | |
| 1. Is unable to drive an automobile | 1 | |
| 2. Drives when someone is present to give directions; drives poorly (weaves from side to side, is slow in stopping for red lights and at stop signs, etc.); drives very slowly and cautiously | 2/3 | |
| 3. Drives alone but has some tendency to lose way and get lost; has some problems driving such as occasionally driving too close to cars on either side or overshooting a traffic light or stop sign | 1/3 | |
| 4. Drives alone, has good sense of direction and good driving skills | 0 | |

NOTE: Items which are not appropriate or unknown receive a score of 0.

APPENDIX 2

Modified Hachinski Ischemic Score (HIS)

Item	Points
I. Presence of focal signs (i.e., elicited by the patient on examination).	+2
II. Presence of focal symptoms (i.e., features which the individual presents with spontaneity)	+2
III. History of strokes:	
1 stroke	+2
2 strokes	+2-1/4
3+ strokes	+2-1/2
if last stroke occurred more than 20 years ago	0
if last stroke occurred between 5-20 years ago	+1/16
if last stroke occurred between 1-5 years ago.	+1/8
if last stroke occurred within the past year	+1/4
IV. Hypertension (based on an average of all reported blood pressure readings)	
if total is less than or equal to 140/90	+0
if systolic is any amount over 140; diastolic 90 or less	+1-1/2
if diastolic is 90-110; systolic 140 or less	+1-1/2
if diastolic is 111-125; systolic 140 or less	+1-3/4
if diastolic is over 125; systolic 140 or less	+1-7/8
if diastolic is 90-110; systolic is greater than 140	+1-3/4
if diastolic is 111-125; systolic is greater than 140	+1-7/8
if diastolic is 126 or greater; systolic is greater than 140	+1-15/16
V. Associated Atherosclerosis (any of the following conditions: congestive heart failure, atherosclerotic heart disease, atrial fibrillation, angina, myocardial infarction, peripheral vascular insufficiency, etc.):	
one condition only	+1
two conditions	+1-1/4
three conditions	+1-3/8
four or more conditions.	+1-7/16